

REMARKS

Claim 23 has been amended for purposes of clarity and thus for reasons unrelated to patentability. The headings below are numbered to correspond with the headings in the Office Action.

Further, if the Examiner is of the opinion that this Amendment does not place the application in a condition for allowance, Applicants hereby request an Examiner interview to discuss any outstanding rejections prior to issuance of another action by the Examiner.

1. Claim 23 has been clarified.

The term "wherein the solder balls" in Claim 23 has been amended to recited --wherein solder balls--.

For the above reasons, Applicants respectfully request reconsideration and withdrawal of the objection to Claim 23.

2/3. Claims 1-15, 22-25 are patentable over Boon et al (6,882,021) and Tu et al. (6,559,539) and Komiyama (6,329,708).

Claim 1 recites:

A semiconductor package comprising:
an image sensor die comprising:
a photo sensing surface, the photo sensing surface converting lights incident from an outside into electrical signals;
bond pads formed around the photo sensing surface;
first conductive bumps formed at the bond pads;
a non-photo sensing surface opposite to the photo sensing surface; and
side surfaces, each of the side surfaces formed between the photo sensing surface and the non-photo sensing surface;
a substrate comprising:
an insulative layer comprising a window formed at an area corresponding to the photo sensing surface of the image sensor die, the insulative layer attached to the non-photo sensing surface of the image sensor die by a first adhesive;
electrically conductive patterns formed at the insulative layer and connected to the first

conductive bumps, the electrically conductive patterns extending over one of the side surfaces and the non-photo sensing surface of the image sensor die; and

first holes formed at the insulative layer corresponding to the non-photo sensing surface so that the electrically conductive patterns are opened downward; and

a glass attached to the insulative layer of the substrate by a second adhesive to cover the window.
(Emphasis added.)

With regards to Boon et al., the Examiner admits:

Boon et al. **do not show an insulative layer** extending over a side surface of side sensor die and attached to the non-photo sensing surface via an adhesive, **the window explicitly made of glass**, ... (Office Action, page 3, emphasis added).

With regards to the Examiner's statement that "Boon et al. do not show ... the window explicitly made of glass", Applicants note that Claim 1 recites, in part, **"a glass attached to the insulative layer of the substrate by a second adhesive to cover the window"**, emphasis added. Accordingly, it is irrelevant that Boon et al. does not show "the window explicitly made of glass".

Further, since "Boon et al. **do not show an insulative layer** extending over a side surface of side sensor die and attached to the non-photo sensing surface via an adhesive" as admitted by the Examiner, emphasis added, Applicants respectfully submit that Boon et al. necessarily does not teach or suggest **a window in an insulative layer**.

Tu et al. and Komiyama do not cure this glaring deficiency in Boon et al.

With respect to Tu et al., the Examiner states:

Tu et al. teach (e.g. Figure 3) to attached a memory die 22 to the non-photo sensing surface of an image sensor die 26 and to put conductive bumps 36 interposed between the memory die and conductive patterns 16 to

lower costs (Column 3 line 64 to Column 4 Line 11.)
(Office Action, page 3.)

Accordingly, the Examiner has failed to callout where either Boon et al or Tu et al. teach or suggest a window in an insulative layer.

With respect to Komiyama, the Examiner states:

Komiyama teaches (e.g. Figures 7 to 9) to have an insulative layer 609a extending over a side surface of side **sensor die 601a** and attached to the non-photo sensing surface via an adhesive 607a and a first curved portion 608a having a curvature on the side of said **image sensor die 601a** and first and second memory dies 601b attached as claimed to reduce manufacturing costs (Column 8 Lines 3 to 11). (Office Action, pages 3-4, emphasis added.)

The Examiner's statement that Komiyama teaches an "image sensor die 601a" is respectfully traversed. Komiyama teaches:

In the semiconductor devices 600a, 600b of the semiconductor module 600, tapes 608a, 608b are fixed to **semiconductor chips 601a, 601b** via buffer layers 607a, 607b, respectively. (Col. 5, lines 22-25, emphasis added.)

Accordingly, Komiyama teaches a semiconductor chip 601a. The Examiner has failed to callout where Komiyama teaches or suggests that the semiconductor chip 601a is an "image sensor die 601a" as asserted by the Examiner.

Further, as the devices of Komiyama are to be stacked one upon another, Komiyama teaches away from the semiconductor chip 601a being an "image sensor die 601a" as the semiconductor chip may be covered by another device thus obviating the purpose as an "image sensor die 601a".

For example, Komiyama teaches:

... it is an object of the present invention to provide a semiconductor device and a semiconductor module which

can be stacked and mounted quite readily. (Col. 1, lines 47-49.)

As Komiyama does not teach or suggest an image sensor die, Komiyama does not teach, and in fact teaches away from, a window in an insulative layer.

For the above reasons, Boon et al., Tu et al. and Komiyama et al. do not teach or suggest a semiconductor package as claimed in Claim 1. Accordingly, Claim 1 is allowable over Boon et al., Tu et al. and Komiyama et al. Claims 2-12, which depend from Claim 1, are allowable for at least the same reasons as Claim 1.

Claims 13, 24 are allowable for reasons similar to Claim 1. Claims 14-15, which depend from Claim 13, are allowable for at least the same reasons as Claim 13. Claims 22-23, 25, which depend from Claim 24, are allowable for at least the same reasons as Claim 24.

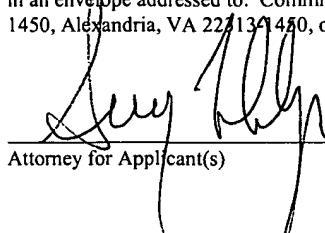
For the above reasons, Applicants respectfully request reconsideration and withdrawal of this rejection.

Conclusion

Claims 1-15, 22-25 are pending in the application. For the foregoing reasons, Applicants respectfully request allowance of all pending claims. If the Examiner has any questions relating to the above, the Examiner is respectfully requested to telephone the undersigned Attorney for Applicant(s).

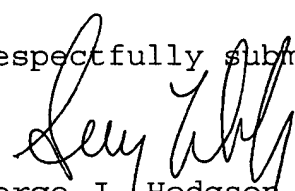
CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on February 23, 2006.


Attorney for Applicant(s)

February 23, 2006
Date of Signature

Respectfully submitted,


Serge J. Hodgson
Attorney for Applicant(s)
Reg. No. 40,017
Tel.: (831) 655-0880